69832

S/051/60/008/03/002/038
E201/E191

24.6510

AUTHORS: Biberman, L.M. and Yakubov, I.T.

TITLE: An Approximate Method of Calculation of the Frank-Condon Factors

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 3, pp 294-299 (USSR)

ABSTRACT: The distribution of intensities in an electron-vibrational system of bands of a diatomic molecule is given in terms of the Frank-Condon factors, which are squares of the integrals of overlapping of vibrational wave-functions of the upper and lower electron states:

$$q(v', v'') = [(v', v'')]^2 = \left[\int_0^\infty \Psi v'(r) \cdot \Psi v''(r)\, dr\right]^2. \quad (1)$$

The number of papers dealing with calculations of the Frank-Condon factors is large. Nevertheless the subject is not closed since the published methods are suitable only for calculations in the case of small quantum numbers v. The approximate method, with its three variants, described in the present paper can be used to calculate the Frank-Condon factors for large v.

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E201/E191

An Approximate Method of Calculation of the Frank-Condon Factors

Calculation of the Frank-Condon factors is difficult because of the special properties of the generalized Laguerre polynomials. The present paper describes three variants of solution of the problem. (A) for large values of v the Laguerre functions can be replaced by asymptotic expressions which are obtained using the W.K.B. method to solve Schrödinger's equation with a Morse potential. (B) In the regions of the "turning" points where the W.K.B. method cannot be used, the Laguerre functions are approximated by means of monotonic sections of selected Hermite functions. These can be found fairly easily and (v', v") can be found by graphical integration. The precision of the results will increase with increase of v' and v" until the Morse function represents accurately the experimental potential curve. (C) Some problems do not require accurate knowledge of q(v', v"). In such cases an approximate method of calculation of the Frank-Condon factors can be employed in asymptotic expressions for the Laguerre functions which need not be plotted and this eases considerably the calculations.

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E201/E191

An Approximate Method of Calculation of the Frank-Condon Factors

To check the variant (C) the authors calculated the values of $q(v', v'')$ for $v' = 0, \ldots, 6$ and $v'' = 12 = \text{const.}$, making assumptions identical with those of Kivel, Mayer and Bethe (Ref 1) and using tabulated Hermite functions. The results are given in Table 1 where they are compared with the values calculated by Kivel et al (Ref 1), who used a computer. The variant (C) was also used to calculate $q(v', v'')$ of the first positive system of N_2 with $v'' = 8$. For $v \geqslant 4$ the present authors employed functions obtained using the W.K.B. method. For $v = 2$ and 3 "distorted" functions were obtained by a modified Pillow method (Ref 4). For $v = 0$ and $v = 1$ the authors used harmonic functions. The results obtained for N_2 are compared in Table 2 with the results of Jarmain and Nicholls (Ref 2); the latter authors published the only known table of the Frank-Condon factors, obtained by very laborious graphical integration of the Laguerre functions. Tables 1 and 2 show that the approximate method described in the present paper gives satisfactory results; the

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An Approximate Method of Calculation of the Frank-Condon Factors

errors do not exceed 20%. The large Frank-Condon factors, which are of main interest, can be calculated more precisely than the small factors.
There are 3 figures, 2 tables and 10 references, of which 1 is Soviet, 8 English and 1 German.

Card
4/4

SUBMITTED: June 9, 1959

S/051/60/008/04/001/032
E201/E691

AUTHORS: Biberman, L.M. and Norman, G.E.

TITLE: On the Calculation of Photo-Ionization Absorption

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 4, pp 433-438 (USSR)

ABSTRACT: There is a large number of papers on the subject of calculation of the absorptive power of hot gases, the absorption being due to photo-ionization of excited atoms. The authors review published work (Refs 1-5) and conclude that Unsöld's absorption coefficient formulae (Ref 1) have no theoretical or experimental foundation. The present paper is an attempt to give a theoretical basis of photo-ionization absorption by atoms more complex than hydrogen. The authors derive also simple approximate expressions for calculation of the photo-ionization cross-sections of complex atoms, assuming that the excited states of the latter obey the Boltzmann distribution law. The photo-ionization cross-section κ is found in terms of the absorption frequency ν, the absolute temperature T and the energies of the atomic states (Eq 6). The expressions found for the absorption coefficient (Eqs 6 and 11 or 12'), together with Kirchhoff's law, make it possible to calculate the emissivity due to recombination of electrons

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S/051/60/008/04/001/32
E201/E691

On the Calculation of Photo-Ionization Absorption

with ions. Comparison of the expressions derived by the authors with the experimental data of Boldt (Refs 6, 7) is given in Figs 2 and 3. In these figures curves 1 represent the measured absolute emissivity of arcs burning in pure oxygen (Fig 2) or pure nitrogen (Fig 3) at pressures of 1 atm.; the arc temperatures were 10 500-13 000°K. If the effect of formation of negative ions and free-free electron transitions are allowed for, the corrected emissivities are 60-70% lower than those given by curves 1 in Figs 2 and 3. The corrected emissivities agree better with the authors' calculations (curves 3 in Figs 2 and 3) than with Unsöld's values (curves 2' and 2"). There are 3 figures and 8 references, 2 of which are English and 6 German.

SUBMITTED: July 1, 1959

Card 2/2

S/056/60/039/001/034/041/XX
B006/B056

24.2100

AUTHORS: Biberman, L. M., Veklenko, B. A.

TITLE: A Generalized Reciprocity Principle

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 1(7), pp. 88-93

TEXT: The reciprocity principle is found to be very useful for the development of a radiation transfer theory and the solution of concrete problems in this field. The principle has repeatedly been mathematically formulated (Refs. 1-6), but such formulation was in all cases incomplete, above all because it was assumed that the radiation frequency does not change during the transfer process. Already in an earlier paper the authors showed (Ref. 7) that the application of the theory of random processes to the phenomena of the radiation transfer leads to two systems of equation, which correspond to the Kolmogorov-Feller equations. From the coexistence of both systems of equation, a generalized reciprocity principle may be obtained, and the limits of its applicability may be determined. The case is investigated, in which the radiation frequency changes during a transfer

A Generalized Reciprocity Principle S/056/60/039/001/034/041/XX
B006/B056

process. The relations obtained contain the mathematical formulations of other authors as special cases. Some of these cases are discussed, thus the case of pure scattering, of radiation transfer in a scattering and absorbing medium (B. B. Kadomtsev) and of a special case treated by V. V. Sobolev of radiation transfer in a plane-parallel scattering gas. In order that the generalized reciprocity principle be satisfied it is not necessary that thermodynamic equilibrium exists. If, however, an equilibrium distribution exists with respect to all energy states, the generalized reciprocity principle is guaranteed for any kind of change-mechanism of radiation frequency, including transitions between different energy levels. There are 13 references: 9 Soviet and 1 German.

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Institute of Power Engineering)

SUBMITTED: December 24, 1959

Card 2/2

BIBERMAN, L.M.; NORMAN, G.E.; UL'YANOV, K.N.

Calculation of photoionization absorption in atomic gases. Opt. i spektr. 10 no.5:565-569 My '61. (MIRA 14:8)
(Photoelectricity)

38933
S/057/62/032/007/006/013
B104/B102

26.2540

AUTHORS: Biberman, L. M., Toropkin, Yu. N., and Ul'yanov, K. N.

TITLE: Theory of stepwise ionization and recombination

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 7, 1962, 827-834

TEXT: Considering radiative recombination by which a many-electron excited atom is formed, the probabilities for ionization of excited atoms by radiation and by electron impact are investigated, as well as the probabilities for the corresponding recombinations. The coefficient

$$\alpha^c = 1.04 \cdot 10^{-11} T^{-1/2} [\ln 1.78 u_g - e^{u_g} E_1(u_g)].$$

for the spontaneous recombination of a hydrogen atom in the n-th state is obtained from the expression

$$\alpha_n^c = \frac{2^9 \pi^{7/2} e^{10}}{6^{5/2} m^{1/2} c^3 \hbar^3 (kT)^{5/2}} \frac{1}{n^3} e^{\frac{I_1}{n^2 kT}} E_1\left(\frac{I_1}{n^2 kT}\right),$$

derived by G. Elwert (Zs. f. Naturforsch., 7a, 432, 1952) by summation

Card 1/2

over n and after exclusion of some low states.

$$E_i(x) = \int_x^\infty e^{-t}/t\,dt;$$

I_1 is the ionization energy from the ground state, $u_1 = I_1/kT$; $u_g = \nu_g/kT$.

The stepwise ionization of atoms by electron impact is studied in Bethe-Born approximation. It is shown that the ionization of excited atoms plays the main part in a plasma which is nearly in equilibrium. The recombination by triple impact (ion + 2 electrons) is similarly stepwise. In deriving the appropriate ionization and recombination coefficients it is shown that the choice of the initial effective cross section has little effect on the result. There is 1 table.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)

SUBMITTED: July 3, 1961

BIBERMAN, L.M.; VOROB'YEV, V.S.; NORMAN, G.E.

Energy emitted by an equilibrium plasma in spectral lines. Opt. i spektr. 14 no.3:330-335 Mr '63. (MIRA 16:4)
(Plasma (Ionized gases)) (Hydrogen--Spectra)

BIBERMAN, L.M.; YAKUBOV, I.T.

Establishment of ionization equilibrium behind the shock wave front in an atomic gas. Zhur. tekh. fiz. 33 no.11:1344-1353 N '63. (MIRA 16:12)

1. Moskovskiy ordena Lenina energeticheskiy institut.

ACCESSION NR: AP4009121 S/0056/63/045/006/1970/1977

AUTHORS: Biberman, L. M.; Norman, G. E.

TITLE: Semiempirical method for calculating the cross section for the elastic scattering of slow electrons by atoms

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 45, no. 6, 1963, 1970-1977

TOPIC TAGS: electron atom elastic scattering, slow electron scattering, scattering length, effective scattering range, quantum defect, isoelectronic extrapolation, elastic scattering cross section, electron argon scattering, electron neon scattering, Ramsauer effect

ABSTRACT: In view of the relatively scanty published data on elastic scattering of slow electrons by atoms, and in view of the felt need for semiempirical methods by which to calculate this scattering, the authors propose a method in which the scattering length and

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ACCESSION NR: AP4009121

the effective range of electron elastic scattering from a neutral atom can be determined by isoelectronic extrapolation in terms of the quantum defect of the electron in the ion fields. The method is based essentially on the quantum-defect method proposed by Seaton (C. R., Paris, v. 240, 1317, 1955) and the extrapolation is carried out not with respect to Z but with respect to model potential parameters which are chosen to correspond to experimentally known quantum defects. By way of an example, the cross sections are determined for the elastic scattering of electrons by argon and neon atoms at energies up to 1 eV. The results obtained are in satisfactory agreement with the available data, for example, the scattering length was found to be negative for argon and positive for neon, in correspondence with the fact that the Ramsauer effect is observed for argon and not for neon, in spite of the fact that the cross sections of argon and neon turn out to be almost the same. "In conclusion we are indebted to A. Kh. Mnatsakanyan and A. N. Starostin for many interesting discussions." Orig. art. has: 4

Card 2/3

ACCESSION NR: AP4009121

figures, 14 formulas, and 2 tables.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power-Engineering Institute)

SUBMITTED: 31May63	DATE ACQ: 02Feb64	ENCL: 00
SUB CODE: PH	NO REF SOV: 004	OTHER: 028

Card 3/3

L 9092-65 EWG(j)/EWT(l)/EPA(b)/EWT(m)/EPF(c)/EPR/EWP(q)/FCS(k)/EWP(b)/EWA(h) Pd-4/Pr-4/Ps-4/Pi-4 AFETR/ASD(f)/ASD(p)-3/AFWL/ESD(c)/AEDC(a)/BSD/SSD/RAEM(t)/ AS(mp)-2/RPL JD/WW

ACCESSION NR: AP4042458 S/0294/64/002/003/0333/0336

AUTHOR: Biberman, L. M.; Sevast'yanenko, V. G.; Yakubov, I. T.

TITLE: Photodissociation of oxygen ahead of the front of a shock wave in air B

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 3, 1964, 333-336

TOPIC TAGS: shock wave, dissociation, photodissociation, air absorption, photoionization

ABSTRACT: A theoretical investigation has been made of photodissociation ahead of a shock wave front due to absorption of radiation emitted by air heated by a strong shock wave. The degree of dissociation (β) of oxygen as a function of the pressure (p) of the air behind the shock wave front was calculated numerically and plotted in Fig. 1 of the Enclosure: $\beta(x) = \frac{n_O(x)}{n_O(x)+n_{O_2}(x)}$; n_O and n_{O_2} are the densities of oxygen atoms and oxygen molecules expressed in terms of (x), the distance from the wave front measured along a normal to the front. The calculations were conducted for a homogeneous layer of emitting gas 10 cm thick in a

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ACCESSION NR: AP4042458 2

state of equilibrium. Fig. 1 shows that the degree of dissociation of oxygen is considerable at 14,000K. At 17,000K the degree of dissociation is close to unity at pressures between 1—10 atm, i.e., an almost total dissociation of oxygen molecules takes place at the front of the shock wave. It is [illegible] assumption used in calculating $\beta(o)$ given in Fig. 1, that is that the recombination of oxygen atoms in a cold gas can be neglected, is justified for a wide range of parameters and up to values of β equal to several tenths. The collision processes leading to formation of O_2 and N_2O molecules were found to have little effect on the density of oxygen atoms. As a result of elastic collisions, the excess energy of about 1.2 ev attained by oxygen atoms during dissociation is transferred to other gas particles. Therefore, when oxygen is completely dissociated, the temperature of gas at the front increases by approximately 1000—3000K. Orig. art. has: 6 formulas, 1 table, and 1 figure.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)

SUBMITTED: 24Feb64 ATD PRESS: 3105 ENCL: 01

SUB CODE: GC, ME NO REF SOV: 007 OTHER: 003

Card 2/3

L 9092-65
ACCESSION NR: AP4042458

ENCLOSURE: 01

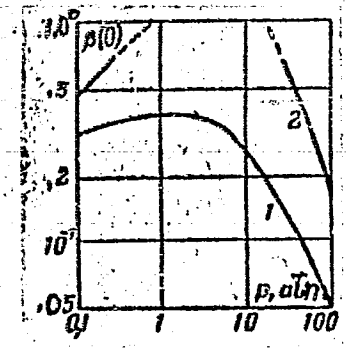

Fig. on p. 335

Fig. 1. The degree of dissociation of oxygen at the front of a shock wave β(o) in air as a function of gas pressure behind the wave front. The temperature of the emitting gas behind the wave front: 1 - T = 14,000K, 2 - 17,000K. The values of β(o) close to unity are shown by a dashed line indicating that calculations were conducted without taking into account recombination processes, which for large β(o) decrease its value.

Card 3/3

ACCESSION NR: AP4041567 S/0293/64/002/003/0441/0454

AUTHOR: Biberman, L. M.; Vorob'yev, V. S.; Norman, G.E.; Yakubov, I. T.

TITLE: Radiation heating in the case of hypersonic flow

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 3, 1964, 441-454

TOPIC TAGS: radiation heating, hypersonic flow, shock wave, aerodynamic heating, blunt body, boundary layer

ABSTRACT: The problem of the heating of a blunt body by shock-wave radiation in the case of hypersonic flow (velocities > 8 km/sec) is examined with particular attention given to the case of heating caused by flow under conditions where the gas is almost completely dissociated following a density jump. General expressions are given to compute the radiant fluxes. The main elementary radiation processes involved in the determination of the plasma formed after the density jump are analyzed. Methods of computing the contribution of the individual radiation processes to the radiating capacity of the air are presented. The radiation in the continuous spectrum and in the entire aggregate of spectral lines is considered. Compu-

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ACCESSION NR: AP4041567

tations indicate that: 1) there is a broad interval of temperatures, pressures, and thicknesses of the radiating layer in which the lines make the major contribution to the energy emitted by the plasma, 2) the total energy of a large number of weak lines, computed integrally, with a growth of optical density may noticeably increase the contribution of the individually computed strong lines, and 3) in addition to the visible lines, the lines in the ultraviolet may also play an important role. Computations were also made of the coefficients of absorption and the degree of air darkening in the pressure interval p = 0.001—100 atm and for temperatures to 20,000K. The values of the flow parameters at which the radiant heat flux may exceed the convective flow and cause aerodynamic heating are found. The state of the gas behind the shock wave front is discussed. The causes for the departure from a state of equilibrium and the regions of relaxation and quasi-stationary inequilibrium are analyzed. The main processes determining the structure of the inequilibrium zone at high flow velocities are explained. Orig. art. has: 5 formulas and 3 figures.

ASSOCIATION: none

Card 2/2

ACCESSION NR: AP4020936 S/0051/64/016/002/0320/0324

AUTHOR: Biberman, L.M.; Lagar'kov, A.N.

TITLE: Influence of spectrum lines on the coefficient of radiant thermal conductivity

SOURCE: Optika i spektroskopiya, v.16, no.2, 1964, 320-324

TOPIC TAGS: radiative transfer, thermal conductivity, heat conduction, radiation mean path, absorption coefficient, Rosseland mean, molecular spectrum

ABSTRACT: In certain cases the process of radiative transfer can be considered in the framework of the theory of thermal conductivity. The main difficulty in this case consists in calculating the mean free path of the radiation, or the Rosseland mean, which determines the magnitude of the radiant thermal conductivity coefficient. Accordingly, in the present paper, starting with the usual equation for the radiation mean free path, there is considered the influence of spectrum lines, i.e., the radiation in the region of spectrum lines as opposed to radiation in the continuum, on the Rosseland mean and hence on the value of the radiant thermal conductivity coefficient. It is demonstrated for the specific case of hydrogen plasma that

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ACCESSION NR: AP4020936

neglect of the spectrum lines results in overestimation of the mean free path by a significant factor. The relative importance of the radiation in the lines increases with increasing temperature and pressure. Thus, in some cases neglect of the radiation in the lines and bands may result in appreciable errors. Moreover, taking lines (and bands) into account, by reducing the estimated radiation mean free path, extends the range of applicability of diffusion approximation. Finally, there is proposed an approximate method for calculating the Rosseland mean in the case of superposition of molecular bands on the continuous spectrum. Orig.art.has: 11 formulas and 3 figures.

ASSOCIATION: none

SUBMITTED: 10May63 DATE ACQ: 02Apr64 ENCL: 00

SUB CODE: PH NR REF SOV: 001 OTHER: 005

1/2
Card

S/0051/64/016/003/0394/0401

ACCESSION NR: AP4020951

AUTHOR: Biberman, L.M.; Ul'yanov, K.N.

TITLE: Effect of emission of radiation on deviation from thermodynamic equilibrium

SOURCE: Optika i spektroskopiya, v.16, no.3, 1964, 394-401

TOPIC TAGS: thermodynamic equilibrium, distribution in states, Boltzmann distribution, Boltzmann equation, Saha equation, gas equilibrium, plasma equilibrium, non-equilibrium energy distribution, reabsorption

ABSTRACT: In the state of thermodynamic equilibrium of a gas (or plasma) the distribution of atoms (ions) in energy states is described by the Boltzmann or Saha equations; the radiation field is also in equilibrium and is characterized by a certain temperature (which enters into the Boltzmann or Saha equation). When, however, radiation is emitted, i.e., escapes from the volume of the gas, the system departs from equilibrium and, naturally, the distribution in states may deviate from that characterized by the B. or S. equations. In the present paper the authors consider the effect of emission of radiation on the distribution in states in a system constituted by a gas of real atoms, taking into account the full ensemble of states of

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ACCESSION NR: AP4020951

the discrete and continuous spectrum. That is, there is investigated the influence of emission of line and continuous radiation on the applicability of the Boltzmann and Saha formulas. Initially there is analyzed the simplest case in which reabsorption is absent; then the case when reabsorption is significant. It is shown that under certain circumstances escape of radiation from the system may result in very appreciable deviations from the equilibrium distribution in states. Some numerical calculations for hydrogen plasma are presented, but the method should also be valid for plasmas of other types. The deduced formulas could also be extended, by the introduction of an additional term, to evaluation of departure from equilibrium as a result of escape of charged or excited particles. Orig.art.has: 21 formulas, 2 figures, and 3 tables.

ASSOCIATION: none

SUBMITTED: 10May63 DATE ACQ: 02Apr64 ENCL: 00

SUB CODE: PH NR REF SOV: 006 OTHER: 009

Card 2/2

L 3958-66 EWT(1)/EWP(m)/FCS(k)/EWA(1)

ACCESSION NR: AP5015689 UR/0294/65/003/003/0340/0353
533.921.5

44,55 43
AUTHOR: Biberman, L. M.; Yakubov, I. T. 44,55 40

TITLE: Gas state behind a strong shock front 1,44,55 B

SOURCE: Teplofizika vysokikh temperatur, v. 3, no. 3, 1965, 340-353

TOPIC TAGS: plasma shock wave, shock wave velocity, excited state

ABSTRACT: This theoretical work describing the gas state behind a strong shock front employs a system of equations which are solved by an approximate method that accounts for the role of excited states of atoms and molecules. Specifically, shocks with velocities greater than 10 km/sec in air are considered. It is shown that dissociation occurs rapidly and the length of the relaxation zone is determined by ionization process, which is in contrast to low-velocity shock wave phenomena. In addition, the existence of ionization relaxation zone length on the shock velocity is shown (zone length increases with shock velocity in 9 to 10 km/sec region). In determination of the results, several processes are discussed and shown to be of negligible importance. The results are compared with the experimental data from other work. Orig. art. has: 2 figures, 27 equations.

Card 1/2

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205220008-2"

L 3958-66 3

ACCESSION NR: AP5016689

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)

SUBMITTED: 06Oct64 ENCL: 00 SUB CODE: ME

NO REF SOV: 007 OTHER: 009

Card 2/2

L 3966-66 EWT(1)

ACCESSION NR: AP5025291 UR/0051/65/019/004/0487/0489
539.192

AUTHOR: Biberman, L. M.; Mnatsakanyan, A. Kh.; Starostin, A. N.

TITLE: The connection between the probabilities of radiation processes of the second order perturbation theory

SOURCE: Optika i spektroskopiya, v. 19, no. 4, 1965, 487-489

TOPIC TAGS: perturbation theory, Raman scattering, two photon absorption, Einstein coefficient, spontaneous emission, quantum electrodynamics

ABSTRACT: An attempt is made to relate spontaneous and stimulated Stokes and anti-Stokes Raman scattering processes to spontaneous and stimulated two-photon absorption and emission. The probabilities of these second-order processes in nonrelativistic approximation are determined by universal amplitudes defined in the plane of two frequencies. Knowledge of the amplitude of any one of the processes as an analytical function of the frequency makes it possible, at least in principle, to unequally determine the amplitudes of the other processes, using the reversibility and the cross-symmetry principles. This makes it possible to obtain a relationship between these processes under certain simplifying conditions. The authors show that in the dipole

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ACCESSION NR: AP5025291

approximation unique relationships exist between the universal amplitudes of the emission and the anti-Stokes Raman scattering processes (one is equal to the negative of the other). Using the formulas given and the relationship between the Einstein coefficients it is possible to establish a connection between any pair of the two groups of processes. Orig. art. has: 8 formulas and 1 figure. [CS]

ASSOCIATION: none

SUBMITTED: 08Sep64 ENCL: 00 SUB CODE: OP

NO REF SOV: 003 OTHER: 001 ATD PRESS: 4118

GC

Card 2/2

L 12001-66 EWT(1)

ACC NR: AP5022859 SOURCE CODE: UR/0051/65/019/003/0326/0330

AUTHOR: Biberman, L. M.; Vorob'yev, V. S.; Lagar'kov, A. N.

ORG: none

TITLE: Radiation transfer in an ionization continuum

SOURCE: Optika i spektroskopiya, v. 19, no. 3, 1965, 326-330

TOPIC TAGS: ionization, radiation spectrum, continuous spectrum, spectral line, photon emission

ABSTRACT: This is a continuation of work by one of the authors (Biberman, ZhETF v. 17, 416, 1947), where a theory of radiation transfer in spectral lines was proposed. In the present article this theory is extended to include certain cases of radiation transfer in a continuous spectrum, and in particular to the case of radiation transfer in an ionization continuum. It is shown that such radiation transfer should be considered as a combination of re-emission acts, during which the photon frequencies vary within the limits imposed by the width of the continuum. An integral equation for the concentration of the electrons is obtained, and its approximate solution is given. A system of equations which describes the processes of radiation transfer both within the continuum and in the discrete spectrum is formulated. The extent to which the beam of photons emitted by the elementary domains deviates from an exponential dependence on the distance traversed is analyzed and it is shown that for the very common case when the absorption coefficient is inversely proportional to the cube of the fre-

Card 1/2

UDC:

BIBERMAN, L.M., prof. (Moskva)

S.I. Vavilov Gold Medal. Priroda 54 no.9:123-124 S '65.
(MIRA 18:9)

L 30347-66 EWT(l)/EEC/T LJP(c) GW

ACC NR: AP6014059 (08) SOURCE CODE: UR/0294/66/004/002/0148/0159

AUTHOR: Biberman, L. M.; Mnatsakanyan, A. Kh.

ORG: Moscow Power Engineering Institute (Moskovskiy energeticheskiy institut)

TITLE: Optical properties of air in the temperature interval 4000--10,000K

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 2, 1966, 148-159

TOPIC TAGS: air, optic property, light absorption, temperature dependence, black body radiation, optic transition, electron transition, bremsstrahlung, recombination radiation

ABSTRACT: This is a continuation of earlier work by one of the authors (Biberman et al., Kosmicheskiye issledovaniya v. 2, 441, 1964; Astron. Acta v. 10, 238, 1964) on the optical properties of air at temperatures up to 20,000K. The present article presents additional data on the degree of blackness at temperatures and pressures for which a decisive role is played by electronic transitions in molecules. These data are obtained by calculating the cross sections for various absorption processes connected with various electronic transitions in the diatomic molecules contained in air. The transitions include the Schuman-Runge system for O_2, the β system for NO, the γ system for NO, the first and second positive systems for N_2, the first negative system for N_2^+, the δ and ϵ systems for NO, the Meinel system for N_2^+, the NO bands in the red, near infrared, and vacuum ultraviolet, and the Birdge-Hopefield systems of N_2. Tables of the absorption cross sections for some of these bands are presented.

Card 1/2 UDC: 533.915.546.217.535.343.4

ACC NR: AP6014059

Other radiative processes, such as photodetachment from negative ions, bremsstrahlung and recombination radiation of the electrons, photoionization, and other processes are also considered. The results are compared with recent indirect measurement data. The spectral absorption coefficients are determined and a table of the values of the degree of blackness, supplementing the table in the earlier paper, is presented. The authors thank V. S. Vorob'yev, G. E. Norman, A. N. Starostin, and I. T. Yakubov for useful discussions, and V. V. Davydov and N. I. Kryukov for help with the numerical calculations and the figures. Orig. art. has: 4 figures, 10 formulas, and 11 tables. [02]

SUB CODE: 08,20 SUBM DATE: 11Jun65/ ORIG REF: 017/ OTH REF: 046
ATD PRESS: 5116

L 06559-67 EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) AT/JD

ACC NR: AP6029772 SOURCE CODE: UR/0294/66/004/004/0491/0493

AUTHOR: Biberman, L. M.; Mnatsakanyan, A. Kh.

ORG: Scientific Research Institute of High Temperatures

TITLE: Energy exchange between electron and molecular gases

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 4, 1966, 491-493

TOPIC TAGS: electron gas, electron temperature, Maxwell distribution, Boltzmann distribution, plasma physics

ABSTRACT: The authors consider inelastic collisions between electrons and diatomic molecules in a plasma. Maxwell distribution with temperature T_e is assumed for electron velocity while Boltzmann distribution with temperature T is assumed for the discrete levels of the molecules. This gives

$$dE/dt = n_e \sum_{n=0}^{\infty} N_n \sum_{m=0}^{\infty} (E_n - E_m) P_{nm}(T_e),$$

$$P_{nm}(T_e) = \left(\frac{8kT_e}{\pi m}\right)^{1/2} \frac{1}{(kT_e)^2} \int_0^{\infty} \varepsilon e^{-\varepsilon/kT_e} \sigma_{nm}(\varepsilon)\, d\varepsilon,$$

for the velocity of energy exchange in a unit of volume due to inelastic processes, where n_e is electron concentration; $N_n \approx e^{-E_n/kT}$ is the number of molecules on discrete level n with energy E_n; σ_{nm} is the cross section of inelastic collision with an

Card 1/2 UDC: 533.922

electron which transfers a molecule from level n to level m. Collisions with a change in rotational energy are considered and the simple formula

$$(dE/dt)_{rot} = 4B\left(\frac{8kT_e}{\pi m_e}\right)^{1/2}\frac{8q}{15}\pi a_0^2\frac{T-T_e}{T_e}$$

is derived where B is the rotational constant, q is the quadrupole moment of a molecule in atomic units ea_0^2 equal to ~1 a. u. for N_2. This formula agrees satisfactorily with experimental data. Collisions with a change in vibrational energy are discussed and it is shown that the contribution of inelastic processes to the rate of energy exchange in a nonequilibrium plasma may be considerably greater than that of elastic scattering. In the case of the diatomic nitrogen molecule, the rate of energy exchange as a function of the difference between electron and vibrational temperatures is nonmonotonic due to the resonance nature of collisions with a change in vibrational energy. In other words there are regions for the values of T_e and T where the rate of energy transfer passes through a maximum with a reduction in temperature difference. A similar less pronounced relationship also takes place for elastic scattering. In conclusion the authors thank I. Yakubov and V. Dubner for useful discussions and A. Chikankova for assistant with the numerical calculations. Orig. art. has: 1 figure, 3 formulas.

SUB CODE: 20/ SUBM DATE: 14Jul65/ ORIG REF: 001/ OTH REF: 007

ACC NR: AP6025947 SOURCE CODE: UR/0051/66/021/001/0008/0012

AUTHOR: Biberman, L. M.; Podpalyy, Ye. A.

ORG: none

TITLE: Calculation of the distribution of atoms over energy states

SOURCE: Optika i spektroskopiya, v. 21, no. 1, 1966, 8-12

TOPIC TAGS: energy theory, molecular theory

ABSTRACT: The determination of a set of molecular or atomic energy states involves such difficult computations that in many cases only two, three, or four states can be calculated. If only two populations need be known, a method is proposed whereby one can determine the population ratio of any two states and the relations between them, regardless of the number of other states, and without the necessity of calculating the other states. The populations of two states N_k and N_i are related by

$$N_k W_{ki} = N_i W_{ik}$$

where W_{ki} and W_{ik} account for the relation of the states i and k with any number of other states. It is shown that W_{ki} and W_{ik} can be used without having to calculate

UDC: 539.184.001.24

Card 1/2

ACC NR: AP6025947

them if their physical meaning is known. The equations given can be used for direct transitions between two states, as well as for transitions involving intermediate states. Orig. art. has: 13 formulas.

SUB CODE: 20/ SUBM DATE: 29Jan65/ ORIG REF: 004/ OTH REF: 003

Card 2/2

BIBERMAN, R.I.

Improved cigarette discharger. Khar.prom. no.2:60 Ap-Je '62.
(MIRA 15:9)

1. Feodosiyskaya tabachnaya fabrika.
(Feodosiya—Cigarette industry—Equipment and supplies)

BIBERMAN, Ya.M.

Some aspects of removing calculi from the submaxillary gland.
Stomatologiia 37 no.1:44-48 Ja-F '58. (MIRA 11:3)

1. Iz kafedry propedevtiki khirurgicheskoy stomatologii (zav. - dotsent G.A.Basil'yev) Moskovskogo meditsinskogo stomatologicheskogo instituta (dir. - dotsent G.N.Beletskiy) i Moskvovskogo gorodskogo chelyustno-litsevogo gospitalya (glavnyy vrach - dotsent A.A.Kovner)
(SALIVARY GLANDS --SURGERY)

BIBERMAN, Ya.M.

Diffuse fibromatosis of the gums. Stomatologiia 38 no.6:54-57 N-D '59. (MIRA 13:4)

1. Iz kafedry propedevtiki khirurgicheskoy stomatologii (zav. - dotsent G.A. Vasil'yev) Moskovskogo meditsinskogo stomatologicheskogo instituta (direktor - dotsent G.N. Beletskiy) i Moskovskogo gorodskogo chelyustno-litsevogo gospitalya (glavnyy vrach - dotsent A.A. Kovner).

(GUMS--TUMORS)

LONGHIN,S., prof.; TEODOSIU,Tr.; BIBESCU,Ion; BART,J.

Therapeutic value of chlorofungin (8-oxyquinoline hydrochlorate).
Rumanian M. Rev. 3 no.4:44-46 O-D '59.

1. Clinic of Dermatovenereology,Berceni.
(MYCOSES, therapy)
(QUINOLINES, therapy)
(FINGICIDES, therapy)

BIBI, R.A.; KISELEV, A.V.; KOVALEVA, N.V.; KHOLMS, Dzh. M.; KEMPLIN, M., Ye.R.

Adsorption and state of CO_2, SF_6, and NH_3 on the surface of graphitized carbon black. Part 2. Zhur. fiz. khim. 38 no.4:939-946 Ap '64. (MIRA 17:6)

1. Gruppa khimii poverkhnosti Instituta fizicheskoy khimii AN SSSR i Khimicheskoye otdeleniye Amkhertskogo kolledzha, SShA [Soyedinennyye Shtaty Ameriki].

BIBIANSKI, Miklosh, laureat premii Koshuta (Vengriya)

Reclaimed lands. Nauka i zhizn' 27 no.5:50-52 My '60.
(MIRA 13:7)
(Hortobagy Valley--Reclamation of lands)

BIBIC, C.

Development of the bone marrow in the tarsal bones of cattle

Vet Arh: 11, 510-525 1941

BIBIC, Dr. Cozim

"A Contribution to the knowledge of the Distribution of Trichinellae in Cured Pork." Vet. of the Vet. Inst. at Split, P R Croatia.

SOURCE: Vet. SVEZAK 2, p. 317, 1953

BURIJAN, Jovan; MICIC, Jovan; BIBIC, Dusan

Diabetes appearing during influenza. Srpski arh. celok. lek. 87 no.6:576-581 Je '59.

1. Interna klinika A Medicinskog fakulteta u Beogradu, upravnik: prof. dr Branislav Stanojevic.
(INFLUENZA compl.)
(DIABETES MELLITUS etiol.)

JOSIFOVIC, Djordje; BIBIC, Milorad

Transport expenses of industries, and irrational movement of freight traffic, Pt.1. Zeleznice Jug 20 no.4:1-6 Ap '64.

JOSIFOVIC, Dorde; BIBIC, Milorad

Transport expenses of industries , and irrational movement of freight traffic. Pt.2. Zeleznice Jug 20 no.5:1-8 My '64

MORGULIS, N.D.; BIBICH, I.L.; DYADIN, Yu.A.; KOVALENKO, V.P.

Determination of the electron temperature of a cesium plasma in a thermionic diode by spectral methods. Opt. i spektr. 18 no.5:931-933 My '65. (MIRA 18:10)

POSIK, L.N.; BIBICHENKO, S.I.; GRODKO, R.A.

[Radiometric analysis of ores on conveyers] Radiometricheskii analiz rud na transporterakh. Moskva, Glav. upr. po ispol'zovaniiu atomnoi energii, 1960. 18 p. (MIRA 17:1)

(Ores--Radioactive properties) (Radiometry)

BABENKO, N.P.; BIBICHEV, B.A.; KONSTANTINOV, I.O.; MOSKALEV, A.P.; NEMILOV, Yu.A.

Neutron polarization in (d, n) type stripping reactions with $l_p = 1$. IAd. fiz. 1 no.3:452-455 Mr '65. (MIRA 18:5)

45365

S/056/63/044/001/025/067
B104/B144

24.6500

AUTHORS: Babenko, N. P., Bibichev, B. A., Konstantinov, I. O., Nemilov, Yu. A.

TITLE: Neutron polarization in the $C^{12}(d,n)N^{13}$ reaction

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 135-136

TEXT: The polarization of neutrons from the reaction $C^{12}(d,n)N^{13}$ corresponding to the formation of an N^{13} nucleus in the ground state was measured for a deuteron energy of 6.5 Mev. The neutrons were selected by a conical paraffin collimator at an angle of 40° with the deuteron beam direction. A helium high-pressure scintillation counter was used as analyzer. The chamber of this counter was 4 cm in diameter and 7 cm high, the pressure (He + 7% Xe) was 70 atm. The neutrons scattered by helium under an angle of 123° were recorded by stilbene crystals. The thickness of the Aquadag target corresponded to a loss in deuteron energy of 600 kev, the current to the target was 5 μa. Using a

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B104/B144

Neutron polarization in the ...

polarization value of P_{He^4} = 0.94 for 5.7 Mev neutrons scattered on helium through 123° (B.L.Walter et al., Nucl.Phys., 30, 292, 1962), a value of $P(40^\circ) = (-25.0 \pm 3.0)\%$ was obtained for neutron polarization from the $C^{12}(d,n)N^{13}$ reaction ($E_d = (6.2 \pm 0.3)$ Mev). This value agrees with that obtained in the polarization theory for stripping reactions for this energy range. There are 2 figures.

SUBMITTED: August 10, 1962

Card 2/2

BIBICHKOV, Zinoviy Grigor'yevich; NEMTSOV, F.F., red.

[Production of sliced veneer] Proizvodstvo stroganoi fanery. Moskva, Lesnaia promyshlennost', 1965. 166 p.
(MIRA 18:9)

CHERNYAYEV, R.N., kand. tekhn. nauk; BIBICHKOVA, R.P.

Experimental investigation of oscillation zones in reflex klystrons during performance under pulse conditions. Trudy TSNIIMF no.23:33-37 '59. (MIRA 12:8)
(Klystrons)

ACCESSION NR: AT4031808 S/2914/62/000/079/0031/0039

AUTHOR: Bibichkova, R. P.; Dmitriyev, R. P.

TITLE: Pilot's identification aids

SOURCE: Leningrad. Tsentral'ny*y nauchno-issledovatel'skiy institut morskogo flota. Informatsionny*y sbornik, no. 79, 1962. Sudovozhdeniye i svyaz' (Navigation and communications), no. 20, 31-39

TOPIC TAGS: pilot identification aid, navigation aid, electronic identification aid, harbor traffic, harbor radar, radar, uhf communication, radar repeater

ABSTRACT: In order to facilitate easy identification of various ships on the screen of a harbor traffic control radar, the pilots are equipped with electronic identification aids. These devices, although experimented with in the West, are being designed in the SSSR for the first time. There are two basic classes of identification devices: 1) Devices which respond on a uhf communication link, 2) Radar repeater type. The design of experimental models of both types was performed at the Tsentral'ny*y nauchno - issledovatel'skiy institut morskogo flota (Central Naval Scientific Research Institute) in 1960-61. Figure 1 of the Enclosure shows the block diagram of the uhf device. A pulse received from the

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ACCESSION NR: AT4031808

harbor radar station is detected, amplified and used to modulate either the pilot's portable uhf transmitter or the ship's uhf radio. Voice transmission is excluded during the identification period. The parameters of the device are: sensitivity 65 db/watt for 1 μsec pulse, output voltage amplitude 50-60 volts (4 μsec pulse), power consumption 1.34 watt, supplied by battery with lifetime of 1.5 hours or from pilot's uhf set. The device is made in the form of a pistol and the total weight is 1 kg. A special receiver for reception of pulse modulated uhf signals on shore has a sensitivity of 5 μwatts, an output voltage of 3-4 volts, a carrier frequency of 157 mc, a bandwidth of 2 mc, an image rejection of 70 db, an intermediate frequency rejection of 44 db, and a power requirement of 70 watts. The maximum range from shore to ship is 20 miles and from ship to shore is only 6-8 miles (pilot's portable uhf set). The block diagram of the radar repeater type of device is shown in Figure 2 of the Enclosure. Its characteristics are as follows: receiver sensitivity 55 db/watt, pulse length 4 μsec, peak power 300 mw, processing delay 2 μsec, horn antenna gain 30 (two used), azimuth beamwidth 66.5°, elevation beamwidth 22°, working time 4 hrs., weight 5 kg, maximum range 18-20 miles. A photograph of the indicator screen showing the identification mark produced by this system is shown in Figure 3 of the Enclosure. Depending upon the display gain adjustment, the mark is either 6 separate points or one solid line 3.4 cable lengths (2066 ft.) long, appearing 973 ft. behind the

Card 2/6

ACCESSION NR: AT4031808

ship's echo. It was concluded that the repeater can be used on all ships immediately and that the uhf device should find an application on ships with permanent uhf communication installations. Orig. art. has: 7 figures.

ASSOCIATION: Tsentral'ny*y nauchno-issledovatel'skiy institut morskogo flota, Leningrad (Central Naval Scientific Research Institute)

SUBMITTED: 00 DATE ACQ: 05May64 ENCL: 03

SUB CODE: NG, EC NO REF SOV: 002 OTHER: 000

Card 3/6

ACCESSION NR: AT4031808 ENCLOSURE: 01

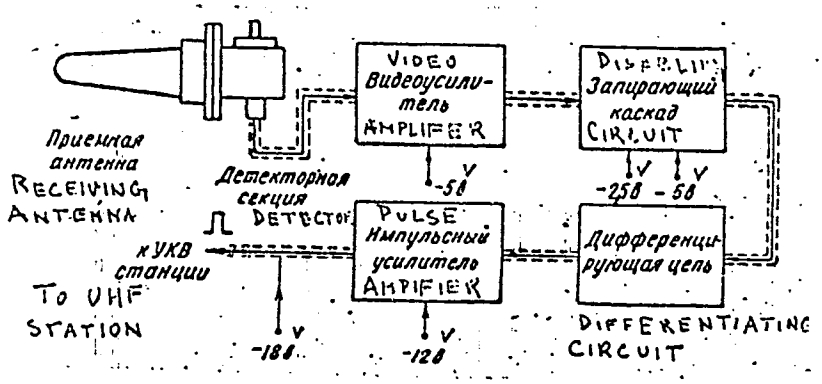

Fig. 1 - Block diagram of pilot's identification aid

Card 4/6

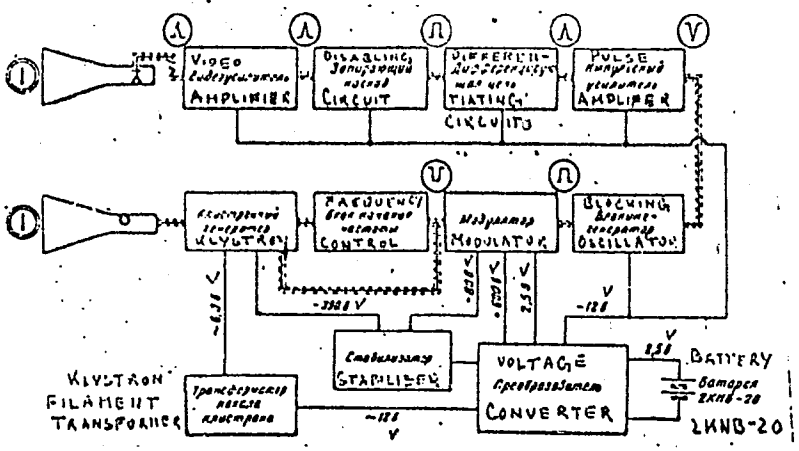

Fig. 2 - Block diagram of pilot's identification aid

Card 5/6

ACCESSION NR: AT4031808

ENCLOSURE: 03

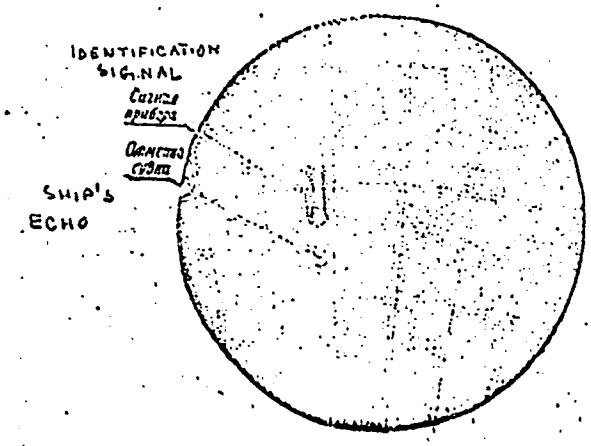

Fig. 3 - Picture on the screen of a radar sector indicator. The identification signal is visible in the form of a wide line behind the ship's echo.

Card 6/6

L 10499-65 EEO-2/FSF(n)/EWT(1)/EEC(t)/EED-2 Pm-4/Pn-4/Pac-4/Pi-4/Pj-4/
Pk-4/Pl-4 RAEM(1)/RAEM(a)/SSD/AFETR/APGC(b)/RAEM(c)/ASD(a)-5/AFWL/ESD/
ESD(t)/RAEM(t) WR

ACCESSION NR: AP4046022 S/0274/64/000/007/E049/E049

B

SOURCE: Ref. zh. Radiotekhnika i elektrosvyaz'. Svodnyy tom, Abs. 7B303

AUTHOR: Semikov, T. T., Shchegolev, V. I.; Bibichkova, R. P.

TITLE: Automatic radar transponder "Ogonek"

CITED SOURCE: Inform. ab. Tsentr. n.-i. in-ta morsk. flota, vyp. 98, 1963, 3-23

TOPIC TAGS: transponder, radar, ship navigation / Ogonek transponder

TRANSLATION: Difficulties in recognizing the objects visible on a shipborne-radar screen are considered. Among possible solutions, the most promising is the building of the radar transponders which would send coded response upon being interrogated by a ship radar. Peculiarities of foreign transponder designs are considered; a Soviet design is described, and tactical and technical data of the "Ogonek" transponder is supplied. A transponder block diagram and functioning of its units are considered in detail. Test results of the "Ogonek" transponder in the Azov Sea and in the Kerch Strait in 1961-62 are reported. Possible navigational uses of the transponder are indicated: identification of easy-slope

Card 1/2

L 10499-65
ACCESSION NR: 4046022

shores which fail to produce echo signals on the radar screen, identification of markers, floating beacons, ships, and operation as autonomous radar approaches. Thirteen illustrations.

SUB CODE: NG ENCL: 00

Card 2/2

POLAND / Organic Chemistry. Synthesis. G-2

Abs Jour: Ref Zhur-Khimiya, No 7, 1959, 23426

Author : Bibiecki, S.; Haase, A.; Izdebski, J.; Kesler, E.; Rylski, L.
Inst : Academy of Sciences of Poland
Title : Some Phthalazine and Pyridazine Derivatives as Potential Hypotensive Agents.

Orig Pub: Bull. Acad. polon. sci. Ser. sci. chim., geol. et geogr., 1958, 6, No 4, 227-233.

Abstract: A preliminary report on the research for new hypotensive agents close to 1-hydrazinophthalazine (I) and 1,4-dihydrazinophthalazine (II). Hydrochloride of N-carbethoxy-N'-phthalazinohydrazine, melt. p. 212° (dissoc.), was obtained from I and $ClCOOC_2H_5$. That hydrochloride, preserving the hypotensive properties of I, is 4 times less toxic

Card 1/3 G-12

POLAND / Organic Chemistry. Synthesis. G-2

Abs Jour: Ref Zhur-Khimiya, No 7, 1959, 23426

Abstract: than the latter. Hydrochloride of 1,4-bis-(carboethoxy-hydrazino)-phthalazine, melt. p. 207° (dissoc.), synthetized from II in an analogous way, is deprived of hypotensive properties. 3-(pyridyl-3')-symm-triazolo-[b]-phthalazine, melt. p. 215-216°, and 3-(pyridyl-4')-symm-triazolo-[b]-phthalazine, melt. p. 253-254°, are formed by the interaction of I with hydrochlorides of nicotinic (III) and isonicotinic acids respectively in pyridine. A similar condensation of 3-hydrazino-6-phenylpyridazine, melt. p. 145-145° with III and IV results in 3-(pyridyl-3')-6-phenyl-symm-triazolo-[b]-pyridazine, melt. p. 188-189°, and 3-(pyridyl-4')-6-phenyl-symm-triazolo-[b]-pyridazine, melt. p. 306-307°, respectively. The synthesis of hydrochlorides of

Card 2/3

POLAND / Organic Chemistry. Synthesis. G-2

Abs Jour: Ref Zhur-Khimiya, No 7, 1959, 23426

Abstract: 6-chloro-I, melt. p. 248° (dissoc.), and 7-chloro-I, melt. p. 248° (dissoc.), and the synthesis of 1-phthalazine hydrazones of the following aldehydes and ketones are also described (the carbonyl compounds and the melting point of the hydrazine in °C are enumerated): acetophenone, 144-145; o-hydroxyacetophenone, 203-205; p-hydroxy-acetophenone, 229-331; o-aminoacetophenone, 268-270; p-aminoacetophenone, 183.5-184.5; o-hydroxybenzaldehyde, 211-212; p-hydroxybenzaldehyde, 197; piperonal, 236-238. Experiments with hydrogenation of hydrazones did not produce positive results. The hypotensive action of hydrazones is weaker and shorter than that of I. -- R. Glushkov

Card 3/3 G-17

BIBIK, A.I.; GORELIK, V.I.; KOROKHOV, V.G.; POLISHCHUK, A.V.

Efficient procedure for manufacturing rolls of reduction rolling mills. Met. i gornorud. prom. no.3:67 My-Je '64. (MIRA 17:10)

L 00363-66 EWT(l)/EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPF(n)-2/EPA(w)-2/T/EWP(k)/EWP(b)/ETC(m) WW/GG/WH

ACCESSION NR: AP5021608 UR/0286/65/000/013/0077/0077

AUTHORS: Litvinenko, I. V.; Bibik, A. P.; Radchenko, I. V.

TITLE: Detector for determining the thermal conductivity of liquids by the method of heating a filament under nonstationary thermal conditions. Class 42, No. 172519

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 13, 1965, 77

TOPIC TAGS: thermal conductivity, fluid

ABSTRACT: This Author Certificate presents a detector for determining the thermal conductivity of liquids by the method of heating a filament under nonstationary thermal conditions. The detector consists of a thin wire-heater which at the same time serves as a resistance thermometer (see Fig. 1 on the Enclosure). To obtain the possibility for producing measuremnets of the thermal conductivity of conducting liquids without a significant increase in detector thickness, the detector is made of a microwire in glass insulation. Orig. art. has: 1 diagram.

ASSOCIATION: none

SUBMITTED: 16Mar64 ENCL: 01 SUB CODE: TD,ME

NO REF SOV: 000 OTHER: 000

L 00363-66
ACCESSION NR: AP5021608

ENCLOSURE: 01

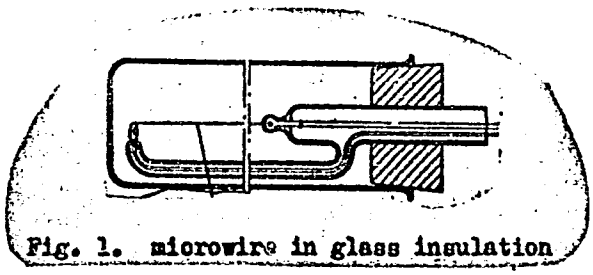

Fig. 1. microwire in glass insulation

Card 2/2

L 8615-66 EWP(e)/EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c) JD/HM/WH

ACC NR: AP5027049 SOURCE CODE: UR/0120/65/000/005/0252/0253

AUTHOR: Litvinenko, I. V.; Bibik, A. P.; Radchenko, I. V.

ORIG: Dnepropetrovsk Metallurgical Institute (Dnepropetrovskiy metallurgicheskiy institut)

TITLE: The welding of glass-coated microwires to thick glass-coated connectors

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1965, 252-253

TOPIC TAGS: glass coating, microwire, welding technology, welding

ABSTRACT: This note describes a new method for welding the end of a glass-coated copper microwire to a glass-coated thicker platinum wire. The welding proceeds under the glass layer and the weld proper remains reliably isolated by a continuous glass layer. The proposed method has been used successfully in the construction of a sensor for heat conduction determination in current conducting liquids using the nonstationary heated filament method. The microwire used was 20 and 12 μ in diameter (resistivity of 70 and 200 ohm/m, respectively) and had coatings 10 and 4 μ thick. Orig. art. has: 3 figures.

UDC: 621.791.762:621.08

SUB CODE: IE, MT / SUBM DATE: 15Jan65 / ORIG REF: 001/ OTH REF: 002

Card 1/1

[illegible]

Metodika prepodavaniia geografii chastei sveta. Posobie dlia uchitelei sred. shkol [Methods in teaching geography of parts of the world; manual for secondary school teachers]. Moskva, Uchpedgiz, 1952. 159 p.

SO: Monthly List of Russian Accessions, Vol 7, No 4, July 1954.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205220008-2"

BIRIN, A. Ye

Prepodavaniye Geografii V 6 Klasse Shkol Rabochey Molodezhi (Teaching Geography In The 6th Class of Schools for Working Youth) Moskva, APN, 1954.
140 P. Tables.
At Head Of Title: Adademiya Pedagogicheskikh Nauk RSFSR.

SO: N/5
621.1
.B5

BIBIK, A.V.

Teaching geography in the Soviet secondary school. Geog.v shkole 20 no.4:1-8 Jl-Ag '57. (MLRA 10:7)
(Geography--Study and teaching)

BIBIK, Antonina Yefimovna,; GALKIN, P.D., red.; TARASOVA, V.V., tekhn. red.

[Methods of teaching the economic geography of foreign countries in the 8th grade] Metodika prepodavaniia ekonomicheskoi geografii zarubezhnykh stran; VIII klass. Moskva, Izd-vo Akad. pedagog. nauk RSFSR, 1958. 229 p. (MIRA 11:12)
(Geography, Economic--Study and teaching)

BIBIK, A.Ye.; SAMOYLOV, I.I.

Improve methods and forms of teaching geography. Geog.v shkole 22 no.5:1-7 S-O '59. (MIRA 13:2)
(Geography--Study and teaching)

SAMOYLOV, Innokentiy Ivanovich; BIBIK, A.Ye., red.; PROZOROV, L.D., red.; TARASOVA, V.V., tekhn.red.

[Methodology of teaching the economic geography of the U.S.S.R.] Metodika obucheniia ekonomicheskoi geografii SSSR. Moskva, Izd-vo Akad.pedagog.nauk RSFSR, 1960. 397 p. (MIRA 13:12)

(Geography, Economic--Study and teaching)

SAMOYLOV, I.I.; BIBIK, A. Ye.

Improving the quality of educational work in geography. Geog. v shkole 24 no.2:21-28 Mr-Ap '61. (MIRA 14:3)
(Geography--Study and teaching)

SAMOYLOV, Innokentiy Ivanovich;BIBIK,Antonina Yefimovna; SHEVYAKOV, Filipp Nikolayevich; PADEZHNOV, A.I., red.; NOVOSELOVA, V.V., tekhn. red.

[Problems of teaching economic geography in evening (staggered) school]Voprosy prepodavaniia ekonomicheskoi geografii v vechernei (smennoi) shkole. Moskva, Izd-vo APN RSFSR, 1962. 68 p. (MIRA 15:9)
(Economic geography—Study and teaching)

BIBIK, A.Ye.

Work of Lipetsk teachers. Geog. v shkole 25 no.4:45-47 Jl-Ag '62. (MIRA 15:8)
(Lipetsk Province--Geography--Study and teaching)

BIBIK, A.Ye., nauchnyy sotr.; GERASIMOVA, T.P., nauchnyy sotr.; SAMOYLOV, I.I., nauchnyy sotr.; PADEZHNOV, A.I., red.; NOVOSELOVA, V.V., tekhn. red.

[Teaching economic geography in secondary schools]O prepodavanii ekonomicheskoi geografii v srednei shkole. Pod red.I.I.Samoilova. Moskva, Izd-vo APN RSFSR, 1962. 86 p. (MIRA 16:1)

1. Akademiya pedagogicheskikh nauk RSFSR, Moscow. Institut obshchego i politekhnicheskogo obrazovaniya.
(Geography, Economic--Study and teaching)

BIBIK, A.Ye.; MATRUSOV, I.S..

Connection between geography and social sciences. Geog. v shkole 26 no.1:4-7 Ja-F '63. (MIRA 16:5)
(Geography--Study and teaching)

BIBIK, A.Ye.; PANCHESHNIKOVA, L.M.

Central "pedagogical readings" on geography in 1963. Geog. v shkole 26 no.2:82-84 Mr-Ap '63. (MIRA 16:4)

(Geography—Study and teaching)

BIBIK, A.Ye.

Let's close the gap between teaching and education. Geog. v shkole 26 no.6:2-4 N-D '63. (MIRA 17:1)

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BIBIK, A.Ya.; DOMETTI, A.A.; ZIMINA, A.M.; LAKTIONOVA, P.I.; MAKSIMOV, N.A.; MOROSHKINA, O.I.; MYASISHCHEVA, B.I.; ERDELI, V.G.; NECHAYEVA, Yu.A.; PADEZHNOV, A.I.; PREOBRAZHENSKIY, A.I.; RAUSH, V.A.; RYNDIN, A.A.; SAUSHKIN, Yu.G.; SMIRNOVA, N.P.; STROYEV, K.F.; TOPORKOV, I.D.; FREYKIN, Z.G.

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L 62091-65 EEC-4/EWA(d)/EWT(1) Pi-4/Pj-4/Pac-4/Peb

ACCESSION NR: AP5016732 UR/0286/65/000/010/0046/0046

AUTHOR: Bibik, G. A. 34 B

TITLE: Connecting device from a cross-shaped waveguide to two rectangular waveguides. Class 21, No. 171037

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 10, 1965, 46

TOPIC TAGS: waveguide coupler, 25 waveguide bend

ABSTRACT: This Author Certificate presents a connecting device from a cross-shaped waveguide to two rectangular waveguides—a primary and a secondary placed in the normal direction to the primary. At the point of intersection along the narrow wall of the primary waveguide there is a wave type stabilizer in the form of a metallic grill (see Fig. 1 on the Enclosure). A groove equal in width to the height of the primary waveguide is made in the wide wall of the secondary waveguide developed relative to the primary by 90°, at the location of its bend of some radius, and symmetric relative to its axis. The edges of this groove are connected to the corresponding edges of a groove in the middle of the wide wall of the primary waveguide so that a cross-shaped waveguide is formed. Orig. art. has: 1 diagram.

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L 62091-65

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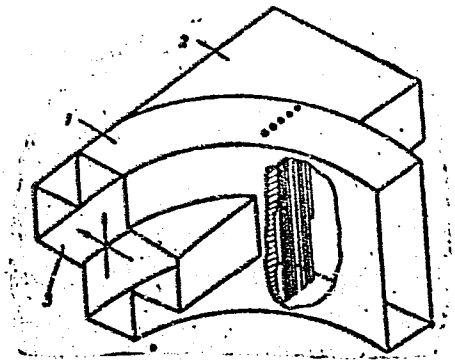

Fig. 1.

1- secondary waveguide; 2- primary waveguide; 3- cross-shaped waveguide

Card 3/3

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